

MOSSES AND THEIR DISTRIBUTION IN THE AUSTRALIAN CAPITAL TERRITORY

HELEN P. RAMSAY¹ & H. STREIMANN²

(Accepted for publication 29.3.1983)

ABSTRACT

Ramsay, Helen P.¹ & Streimann, H.² (¹School of Botany, University of New South Wales, Kensington, N.S.W. Australia 2033; ²Herbarium, National Botanic Gardens, Canberra A.C.T. Australia 2601). Telopea 2(5): 559-574. — The Australian Capital Territory is geographically located on the Southern Tablelands of New South Wales. The area is physiographically and climatically diverse with alluvial terrain to high ridges reaching 1900 m. More than 180 species from 39 families and their distribution within the A.C.T. are recorded. Data on distribution in other regions of N.S.W. and in other Australian states are also given. Affinities are mainly with temperate mosses of southern Australia.

INTRODUCTION

The Australian Capital Territory (A.C.T.), although a discrete political territory, is geographically located on the Southern Tablelands of New South Wales. In area it covers 2357 sq. km with more than half being occupied by rugged mountainous catchment areas (Learmonth 1973). Canberra, the capital city of Australia, lies on a plain 600 m above sea level and approximately 100 km from the coast on the western side of the Great Dividing Range in the A.C.T.

The physiography of the A.C.T. can be divided into: (i) high ridges and steep hillslopes; (ii) rolling terrain; (iii) gently undulating terrain; (iv) alluvial terrain. The Murrumbidgee River and its tributaries, the Molonglo and Cotter rivers, pass through the Territory. The Murrumbidgee and Molonglo drain from the Great Dividing Range, while the Cotter originates in the ranges west of Canberra. On the western boundary are the Brindabella-Bimberi Ranges that connect with the Snowy massif. The Scabby-Boboyan Ranges form the southern boundary. A number of peaks within these ranges reach 1800 m with Bimberi Peak 1903 m in the south the highest. They form a dissected plateau, part of the Kosciusko peneplain, cut across by folded and steeply dipping Ordovician and Silurian slates, schists, slaty shales and grit, Silurian volcanics, with some Palaeozoic porphyry, granite, and Devonian igneous rocks. Alluvial flats form the Canberra basin, a rain-shadow area often having less than 600 mm rainfall (Learmonth 1973).

Great variations in climate occur between the Canberra plain and the higher peaks on the western ranges. There are numerous rain-shadows in the deeper valleys, but the main rain-shadow is the Canberra plain itself. It is dry during the summer, most of the rainfall being derived from a few downpours, but high evaporation rates, about 1600 mm annually, reduce its effectiveness. On the ranges the precipitation may reach 1500 mm per year, and is more uniform. In winter, inversions cause fogs and some of the grasslands in the higher valleys may have evolved from the settling of cold air. In addition, Canberra gets about 100 days of frost per annum, with a large range of diurnal temperatures in both winter and summer. Less is known of the climate at higher altitudes but data in Table 1 (see page 563) illustrate some of the variation at different altitudes.

Snow occurs on the ranges above 1220 m and on the higher parts (above 1500 m), where it may lie for 3 to 4 months. Soils tend to correlate to topography, geology and the climatic influences over long periods.

DISTRIBUTION WITHIN THE A.C.T.

Vegetation in the A.C.T. has affinities with elements from Mt Kosciusko, the Victorian Alps and Tasmania. The zonations of the A.C.T. vascular flora are mostly altitudinal. Little has yet been done on the altitudinal distribution or the ecology of the non-vascular flora except on Mt Ainslie and Blaeck Mountain. Much of the vegetation has been greatly modified by man since European settlement (Pryor 1954).

Natural features or major roads have been used to define five topographically separate divisions of the A.C.T. for this project (see Fig. 1). The Brindabella Ranges division encompasses almost all the topographical environments found in the A.C.T. The following are short descriptions of each division. (Jervis Bay is excluded as it is geographically in a separate part of New South Wales and unrelated floristically to the rest of the A.C.T.)

Division 1. BOOTH RANGE (east side of Gudgenby Road)

Three vegetation types predominate here. At higher altitudes (>700 m) *Eucalyptus delegatensis* – *E. dalrympleana* form wet sclerophyll forest. In the broad upper valley systems *E. pauciflora* – *E. stellulata* savannah woodlands are present, while in the northern area between the Booth and Clear Ranges *E. melliodora* – *E. blakelyi* woodlands occur (Burbidge & Gray 1970). There has been very little disturbance to the area except for grazing in the north. Most of the area is in the Namadgi National Park.

The altitude ranges from 640 m to 1600 m (Mt Clear) with foliated granodiorite as the predominant rock.

Division 2. SOUTHERN RANGES (south of Orroral and west of Gudgenby road)

The vegetation comprises mostly *Eucalyptus delegatensis* – *E. dalrympleana* wet sclerophyll forest with scattered pockets of *E. pauciflora* – *E. stellulata* savannah woodlands along the larger stream valleys. The higher ranges have alpine woodlands of stunted *E. pauciflora* and grasses (Burbidge & Gray 1970). Small areas of *Sphagnum* swamp are scattered throughout this region. Least disturbance has taken place in this division. The Namadgi National Park includes a large area here as well as Division 1.

The main rocks are foliated granodiorites that form large spectacular outcrops. Along the Cotter Valley, from near the confluence of the Orroral and Gudgenby rivers to the southern border, sandstone and greywacke are found. The altitude ranges from 840 m to 1903 m (Bimberi Peak, the highest peak in the A.C.T.).

Division 3. BRINDABELLA RANGES (north of the Orroral–Cotter Hut roads)

The vegetation in this division varies greatly from tree-fern-shaded, humid gullies at the Tidbinbilla Nature Reserve to alpine woodlands of *Eucalyptus pauciflora* on the higher parts of the ranges adjacent to the N.S.W. border. The undulating lowlands along the Murrumbidgee and Paddys rivers carries *E. melliodora* – *E. blakelyi* savannah woodland with *Casuarina cunninghamii* along the banks. However, much of this is now grazing land or *Pinus radiata* plantations. *Eucalyptus macrorhyncha* – *E. rossii* dry sclerophyll forest occurs on northerly and westerly faces of the mountains. Also a section of *E. fastigata* – *E. viminalis* wet sclerophyll forest occurs along the Cotter Valley with a scattered dense understorey of Compositae, Myrtaceae and Rhamnaceae (Burbidge & Gray 1970). Extensive, scattered *Sphagnum* swamps occur at high altitudes on tributaries of the Cotter River. Within the area, moist gullies with tree-ferns and numerous "coastal" moss species, e.g. *Camptochaete* and *Hypnodendron*, are present.

Most of this area, including Mt Gingera, is foliated granodiorite, although a section of greywacke, slate and sandstone occurs at Mts Aggie, Franklin and Ginini. Mt Coree is covered by volcanic rocks and part of the Tidbinbilla Range is

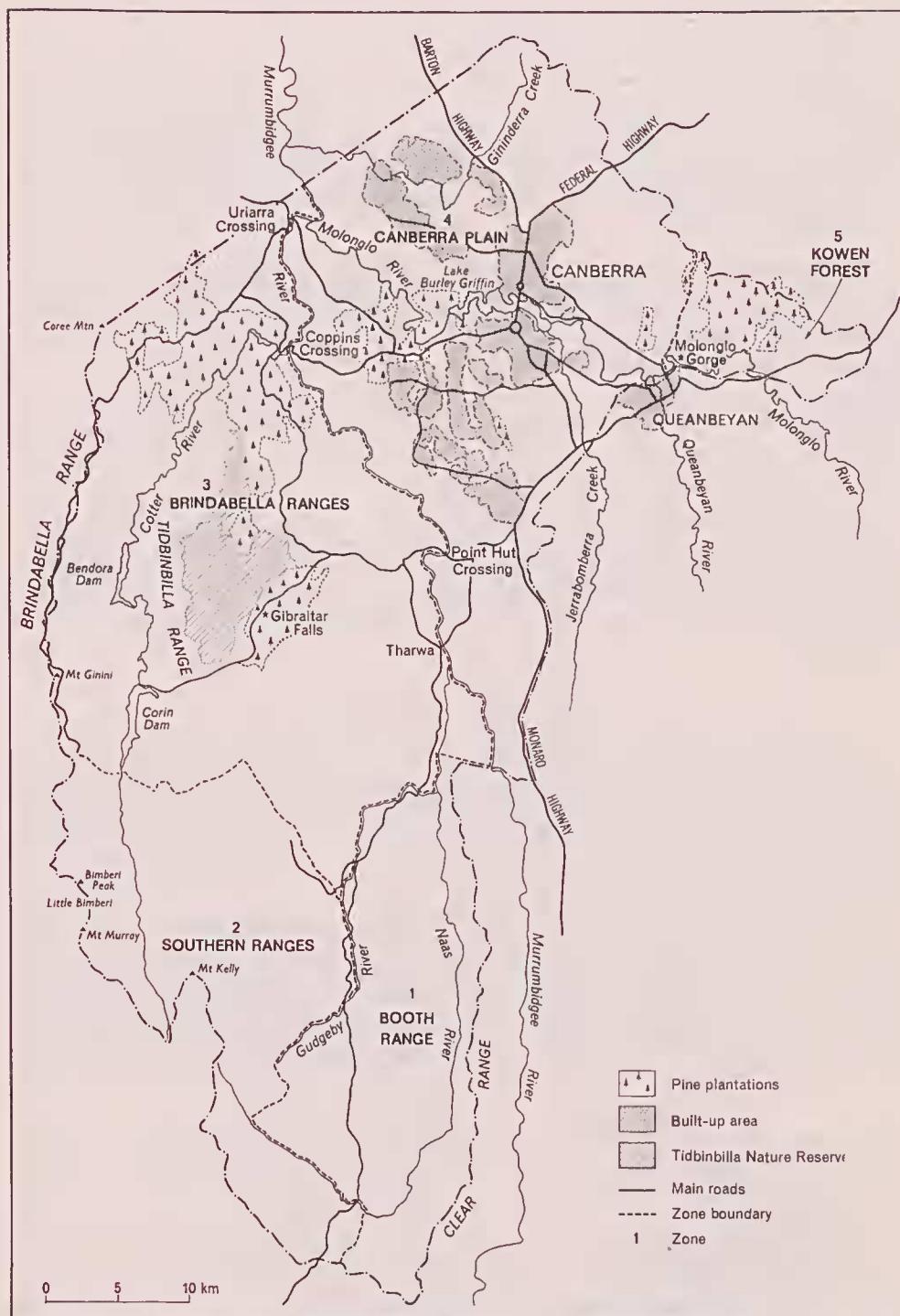


Fig. 1. Australian Capital Territory showing division into areas defined for this study.

quartzite. Volcanic rocks cover extensive areas in the north. The altitude varies between 410 and 1856 m (Mt Gingera).

Division 4. CANBERRA PLAIN (bounded on south-east by Sutton Road and west by the Murrumbidgee River)

This plain has several outercropping mountains — Black Mountain, Mts Majura and Ainslie, and Red Hill. The area is predominantly a mixture of acid volcanic rocks and porphyry. The altitude varies between 410 and 890 m (Mt Majura). The plain is drained by the Molonglo and Murrumbidgee rivers while most of the smaller streams are seasonal.

Much disturbance has been caused by grazing and urbanization. As a result, a large proportion of the original *Themeda-Poa* grasslands of the river flats and the *Eucalyptus melliodora* — *E. blakelyi* savannah woodlands now occur only in small pockets. There are small sections of *E. rossii* — *E. macrorhyncha*, with the most extensive being around Black Mountain.

Division 5. KOWEN FOREST (east of Sutton Road)

Eucalyptus rossii — *E. macrorhyncha* dry sclerophyll forest predominates and savannah woodlands occur along the northern boundary of the A.C.T. Extensive *Pinus radiata* plantations occur in this division.

Folded sedimentary rocks (greywacke, slate and sandstone) form the underlying strata that generally developed shallow, gravelly soils. Most of the area is hilly or rolling country with a steep section along a fault line near the Sutton Road. Further steep sections are encountered along the Molonglo River. This is now a nature reserve and a popular recreation area. The altitude varies between 610 and 920 m.

COMPIILATION OF DATA

The following data, presented in Table 2, have been compiled from field work and herbarium specimens held in the Herbarium Australiense (CANB), and the Herbarium, National Botanic Gardens (CBG) in Canberra; the National Herbarium of New South Wales (NSW), the Herbarium, University of New South Wales (UNSW), the Ray Herbarium, University of Sydney (SYD) and the private collection of Professor D.G. Catcheside.

Names follow those in use according to Index Muscorum plus supplements (Wijk et al. 1959-1969; Crosby 1977, 1979; Crosby & Bauer 1981) together with information from Scott & Stone (1976), Catcheside (1980) and other taxonomic publications. For synonyms, nomina nuda and further information see Census of New South Wales mosses (Ramsay 1984). Families are arranged according to Crosby & Magill (1981), with genera and species listed alphabetically in families.

KEY TO SYMBOLS USED FOR DISTRIBUTION

LHI	Lord Howe Island	FWP	Far Western Plains
C	Coast	N	North
T	Tablelands	C	Central
WS	Western Slopes	S	South
WP	Western Plains	NSW	New South Wales

- > 3 collections in the subdivision
- no sighted or cited specimen from the subdivision
- ? specimen or cited locality inadequate for reliable record
- * number of specimens ≤ 3
- Q — Queensland, V — Victoria, T — Tasmania, Y — Northern Territory,
- S — South Australia, W — Western Australia

TABLE 1. CLIMATIC DATA FOR CANBERRA AND BULLS HEAD.

Location	Alt. (m)	Temperature (°C)						Rain Av. annual (mm)	Evap ^a		
		Jan.		July		Extremes					
		Av. max.	Av. min.	Av. max.	Av. min.	Max.	Min.				
Canberra	600	27.5	13.0	11.1	-0.4	42.2	-10.0	633	1600		
Bulls Head*	1320	21.3	9.7	5.2	-2.0	35.1	-12.2	1009	—		

*Junction Brindabella and Bendora Dam roads.

TABLE 2. MOSESSES AND THEIR DISTRIBUTION IN THE A.C.T.
(families arranged according to Crosby & Magill 1981)

Name	Distribution					N.S.W.	OTHER STATES
	1 Booth Ra.	2 S. Ranges	3 Brindabella	4 Canberra	5 Kowen		
1. SPHAGNACEAE							
<i>Sphagnum cristatum</i> Hampe [<i>S. magellanicum</i> Brid.]	★	●	★	○	○	NC CCT	QVT
<i>S. falcatulum</i> Besch.	○	★	★	○	○	ST only	QVT
<i>S. molliculum</i> Mitt.	○	○	○	○	○	C CCT ST	VTSW
[<i>S. cymbifoloides</i> C. Muell., <i>S. subsecundum</i> auct. non Nees]							
2. ANDREACEAE							
<i>Andreaea australis</i> Mitt.	○	●	★	○	○	ST only	VT
<i>A. mutabilis</i> Hook. f. & Wils.	○	★	●	○	○	CT ST	VT
[<i>A. rupestris</i> auct. non Hedw.]	○	○	○	○	○	ST only	VT
<i>A. nitida</i> Hook. f. & Wils.	○	○	●	○	○		

○ — not collected

★ ≤ 3 collections

● > 3 collections

Name	Distribution					OTHER STATES
	1 Booth Ra.	2 S. Ranges	3 Brindabella	4 Canberra	5 Kowen	
3. FISSIDENTACEAE						
<i>Fissidens asplenoides</i> Hedw.				QVTYSW
<i>F. crassipes</i> Wils. ex B.S.G.				VTS
<i>F. humilis</i> Dix. & Watt				QVTSW
<i>F. leptocladus</i> C. Muell. ex Rodway	●	●	●	QVTWS
<i>F. pungens</i> C. Muell. & Hampe	★	★	●	QVTSW
<i>F. rigidulus</i> Hook. f. & Wils. ssp. rigidulus	●	●	○	CCTST
<i>F. taylorii</i> C. Muell.	●	○	○	CCTST
<i>F. tenellus</i> Hook. f. & Wils.	●	○	○	SWP
<i>F. vitatus</i> Hook. f. & Wils.	●	○	○	CTSW
						CTCSW
DITRICHACEAE						
<i>Ceratodon purpureus</i> (Hedw.) Brid.	..					CTCSW
<i>Distichium capillaceum</i> (Hedw.) B.S.G.	..	○				CTCSW
<i>Ditrichum cylindricarpum</i> (C. Muell.)	..	○				CTCSW
F. Muell.	..	○				CTCSW
[<i>D. elongatum</i> (Hook. f. & Wils.) Mitt.]	..	●				CTCSW
<i>D. difficile</i> (Duby) Fleisch.	..	●				CTCSW
<i>Ecremidium pulchellum</i> (Hook. f. & Wils.) C. Muell.	●	○	○	CC CWS
<i>Pleuridium arnoldii</i> (R. Br. ter.) Par.	..	○				SWS NWP
<i>P. krauseanum</i> Par.	..	○				ST only
<i>P. nervosum</i> (Hook.) Mitt.	..	○				ST only
						V
SELIGERIACEAE						QVTSW
<i>Bindia robusta</i> Hampe	○	○	○	ST only

[†] Retained here as *Dicremnoloma* although Crosby (pers. comm.) and Crosby & Magill (1981) point out this name is preceded by *Sclerodonitium*.

Name	Distribution							OTHER STATES
	1 Booth Ra.	2 S. Ranges	3 Brindabella	4 Canberra	5 Kowen	N.S.W.		
POTTIACEAE (cont'd)								
<i>Gymnostomum aeruginosum</i> (Sm.) Zander	○	○	●	○	○	○	C CCT WS	QVTYSW
[<i>G. calcareum</i>] Nees & Hornsch.	..							
<i>Leptodonium paradoxum</i> Stone & Scott	○	○	★ ○ ○ ○ ○ ○	● ● ● ● ●	○	○	ST only CC ST TWS NFWP NC CCT CC SCT CWS SWS CC SC TWS SWP SFWP ST only	VSW VS VTS QVTSW VTSW VTSW VTSW VTSW V
<i>Pottia starkeana</i> (Hedw.) C. Muell.	○	○	○	●	●	●		
<i>P. truncata</i> (Hedw.) B.S.G.	○	○	●	●	●	●		
<i>Tetrapterium cylindricum</i> (Tayl.) Jaeg.						
<i>Tortula muralis</i> Hedw.						
<i>T. papillosa</i> Wils.						
<i>T. princeps</i> De Not.	●	●	○	●	CC ST	CC SCT WS LHIC T SW NWP NFWP
<i>T. rubra</i> Mitt.	○	●	●	●		
<i>Triquetrella papillata</i> (Höök. f. & Wils.) Broth.	●	●	●	●		
<i>Weissia controversa</i> Hedw.	●	●	●	●		
<i>W. novae-valesiae</i> (Broth. ex Roth) Stone	○	○	●	○	ST CWS SWS	QVTSW
14A.								
YOBARTRAMIACEAE								
<i>ryobartramia nova-valesiae</i> (Broth.) Stone	○	○	●	●		
15.								
GRIMMIACEAE								
<i>Grimmia laevigata</i> (Brid.) Brid.	..		●	●	●	●		
<i>G. pulvinata</i> (Hedw.) Sm.	LHIC TWS NWP SFWP	QVTYSW
<i>G. trichophylla</i> Grev.							LHIC TWS NWP NFWP	QVTYSW
<i>Racomitrium crispulum</i> (Höök. f. & Wils.) Hook. f. & Wils.	..						CT ST SWS	QVTSW
<i>Schistidium apocarpum</i> (Hedw.) B.S.G.	..						T CT WS	VTW QVTSW

Name	Distribution						
	Booth Ra. 1	S. Ranges 2	Brindabella 3	Canberra 4	Kowen 5	N.S.W.	OTHER STATES
BRYACEAE (cont'd)							
<i>B. campylothecium</i> Tayl.	○	○	★	○	○	LHI CT ST CWSSWS SWP
<i>B. capillare</i> Hedw.	★	★	●	★	★	LHI CCT ST WS NF WP LHI CCT ST CWS
<i>B. coronatum</i> Schwaeogr.	○	○	○	○	○	QVTSW QW
<i>B. dichotomum</i> Hedw.	★	○	★	●	★	LHI CCT ST SWS NF WP
<i>B. erythrocarpoides</i> (C. Muell.) Hampet† [<i>B. curvicolle</i> Mitt., <i>B. claratum</i> Hook. f. & Wils.]	○	○	★	○	○	LHI NC CC TCWS
<i>B. laevigatum</i> Hook. f. & Wils.	★	★	●	●	★	QVTS VT
<i>B. cf. muehlenbeckii</i> B.S.G.	★	★	○	○	○	NC CC ST SWS
<i>B. pachythecia</i> C. Muell.	○	○	○	○	CC ST CCT ST
<i>B. pallens</i> Sw.	○	○	○	○	○	QVTSW CWS
<i>B. pseudotriquetrum</i> (Hedw.) Gaertn.	○	○	○	○	○	ST only
<i>B. subapiculatum</i> Hampe	○	○	○	○	○	CC ST
<i>Leptobryum pyriforme</i> (Hedw.) Wilis.	○	○	○	○	○	ST only
<i>Mielichhoferia bryoides</i> (Harv.) Wijk & Marg.	CC ST
<i>Orthodontium lineare</i> Schwaeagr.	VTS
<i>Pohlia nutans</i> (Hedw.) Lindb.	CCT
<i>P. wahlenbergii</i> (Web. & Mohr) Andrews	VT
25. LEPTOSTOMATACEAE							
<i>Leptostomum inclinans</i> R. Br.	NC NT ST NWP
30. MITTENIACEAE							
<i>Mittenia plumula</i> (Mitt.) Lindb.	CCT ST QVTSW

† see Ochi (1980).

Name	Distribution						OTHER STATES
	1 Booth Ra.	2 S. Ranges	3 Brindabella	4 Canberra	5 Kowen	N.S.W.	
ORTHOTRICHACEAE (cont'd)							
<i>O. rupestre</i> Schleich. ex Schwaegeg.	★	★		○	○	○	VT QVTS
<i>O. tasmanicum</i> Hook. f. & Wils.	●	○	○	○	ST SC CS CT
<i>Zygodon intermedius</i> B.S.G.	○	..	●	○	○	○	ST SC CT ST
<i>Z. menziesii</i> (Schwaeg.) Arnott	○	..	○	○	○	○	SWS ST only
44. RACOPILACEAE							
<i>Racopilum cuspidigerum</i> (Schwaeg.) Aongst. var. <i>convolutaceum</i> (C. Muell.) Zant. & Dijkstra	★		○	○	VT QVTSW
47. HEDWIGIACEAE							
<i>Hedwigia ciliata</i> (Hedw.) Ehrh. ex P. Beauv.	●	●	●	○	○	○	CT WS WP CT CW S
<i>H. integrifolia</i> P. Beauv.	○	○	○	C CCT ST
<i>Rhacocarpus purpurascens</i> (Brid.) Par.	○	..	○	○	○	○	CT ST
48. CRYPTOPHYLLACEAE							
<i>Cryptaea tasmanica</i> Mitt.	○	○	○	○	VT
51. PTYCHOMNIACEAE							
<i>Glyphothecium sciuroides</i> (Hook.) Hampe	○	○	○	ST only
59. PHYLLOGONIACEAE							
<i>Catagonium politum</i> (Hook. f. & Wils.) Dus. ex Broth.	○	LHI NCT QVT
60. NECKERACEAE							
<i>Leptodon smithii</i> (Hedw.) Web. & Mohr	★	○	C CCT ST W S
<i>Thamnobryum pumilum</i> (Hook. f. & Wils.) Nieuwl.	○	LHI C ST QVT

61.	LEMBOPHYLLACEAE	Campiochaeate arbuscula (Sm.) Reichdt. <i>Lembophyllum divulsum</i> (Hook. f. & Wils.) Lindb.	.. . . . .	QVT QVTS	QVT QVTS	NC SC T	LHIC CT ST	QVT						
65.	HOOKERIACEAE	<i>Achrophyllum dentatum</i> (Hook. f. & Wils.) Vitv. & Crosby <i>Distichophyllum microcarpum</i> (Hedw.) Mitt. <i>D. pulchellum</i> (Hampe) Mitt. <i>Sauloma tenella</i> (Hook. f. & Wils.) Mitt.	.. . . . .	VTS	VTS	SC C T	LHIC T	VTS						
68.	HYPOPTERYGIACEAE	<i>Hypopterygium rotulatum</i> (Hedw.) Brid.	.. . . . .	QVTS	QVTS	NT ST	SC C T	QVTS						
70.	FABRONIACEAE	<i>Fabronia australis</i> Hook.	.. . . . .	QVTS	QVTS	NC CC ST	CCT ST	CWS SWS						
	<i>F. brachiphylla</i> C. Muell.	.. . . . .	QVTS	QVTS	QVTS	QVTS	CWS SWS	SWP NF WP						
71.	LESKEACEAE	<i>Pseudoleskeia imbricata</i> (Hook. f. & Wils.) Broth.	.. . . . .	QVTS	QVTS	QVTS	QVTS	QVTS						
72.	THUIDIACEAE	<i>Anomodon tasmanicus</i> Broth. <i>Thuidium turtulosum</i> (Hook. f. & Wils.) Reichdt.	.. . . . .	QVTS	QVTS	QVTS	QVTS	QVTS						
	<i>T. furfurosum</i> (Hook. f. & Wils.) Reichdt. var. <i>sparsum</i> (Hook. f. & Wils.) Sainsb.	.. . . . .	QVTS	QVTS	QVTS	QVTS	QVTS	QVTS						
	<i>T. laeviusculum</i> (Mitt.) Jaeg.	.. . . . .	QVTS	QVTS	QVTS	QVTS	QVTS	QVTS						
	<i>T. subglaucinum</i> Card.	.. . . . .	QVTS	QVTS	QVTS	QVTS	QVTS	QVTS						
73.	AMBLYSTEGIACEAE	<i>Acrocladium chamydophyllum</i> (f. & Wils.) C. Muell. & Broth.	.. . . . .	QVTS	QVTS	QVTS	QVTS	QVTS						
	<i>Calliergonella cuspidata</i> (Hedw.) Loeske	.. . . . .	QVTS	QVTS	QVTS	QVTS	QVTS	QVTS						

		LHIC T WSW	QVT SW		
78. HYPNACEAE					
Hypnum cupressiforme Hedw.	..	●	○	SC ST	VT
H. cupressiforme Hedw. var. cupressiforme	..	★	○	ST only	V
H. cupressiforme Hedw. var. filiforme Brid.	..	○	○	ST only	VT
H. cupressiforme Hedw. var. mosmannianum (C. Muell.) Ando	..	○	○		
83. POLYTRICHACEAE					
Atrichum androgynum (C. Muell.) Jaeg. var. androgynum	..	○	○	LHI CC SCT	QVT
Pogonatum subulatum (Brid.) Brid.	..	○	○	C T NWS	QVT
Polytrichastrum alpinum (Hedw.) G.L. Smith	..	○	○	ST only	VT
Polytrichum commune Hedw.	..	○	○	NCT	QVT
P. juniperinum Hedw.	..	○	○	CC SCT WSW	QVTS
84. DAWSONIACEAE				CCT ST WSW	QVTS
Dawsonia longisetia Hampe	..	○	○	SWP	

SUMMARY OF DATA

A total of 180 species are recorded from 39 families. There are no type specimens for which the collection site is listed in the A.C.T. Species that have been attributed to the A.C.T. in Scott & Stone (1976), but for which no specimens have been located, have not been included here.

Species diversity within the five areas described varies greatly. Kowen Forest (Division 5) contains only 34 of the listed species. This area is the smallest with less variation in habitat and has been affected by cultivation, e.g. *Pinus radiata* forests. The Brindabella Ranges (Division 3) have a great range in altitude and habitat from river flats to alpine regions and also have the greatest diversity — 137 species. Although the Canberra Plain (Division 4) is most influenced by settlement, with the City of Canberra and grazing properties covering extensive areas, the moss flora is as diverse (89 species) as in the Southern Ranges (Division 2) (83 species) where there are greater differences in altitude and vegetation and little disturbance has occurred. This latter area is perhaps undercollected at present. The Booth Range (Division 1), which also has had little disturbance by settlement or grazing, has a surprisingly low species number (55 species). Again the area may be undercollected at present.

The relationships and distribution of mosses in the A.C.T. are primarily with temperate species in southern Australia, mainly Victoria and Tasmania. Of the species represented, only 69 occur also in Queensland and most of these are species that have a wider extra-Australian range. There are 35 taxa that have been collected only in the Southern Tablelands of New South Wales although all but two, *Thuidium subglaucinum* and *Brachythecium plumosum*, occur elsewhere in Australia.

ACKNOWLEDGEMENTS

Preparation of these data has depended on much help from a number of people to whom we are most grateful. Dr W.A. Weber allowed use of his unpublished preliminary list of the mosses of the A.C.T. The Directors and staff of the various herbaria have been most co-operative in allowing access to collections. Drs H. Ochi, G.A.M. Scott, I.G. Stone and A. Touw have helped in checking determinations of many species. Professor D.G. Catcheside has provided information on a number of species, including some new records. Professors D.J. Anderson and D.G. Catcheside have assisted with suggestions for improvements to the manuscript. We are indebted to K. Cowan, Australian National University, for preparation of the map in Figure 1.

REFERENCES*

- Gunn, R.H., Storey, R., Galloway, R.W., Duffy, P.J.B., Yapp, G.A. & McAlpine, J.R. (1969). 'Lands of the Queanbeyan - Shoalhaven Area, A.C.T. & N.S.W.' CSIRO: Land Research Series No. 24. (Melbourne.)
- Learmonth, A. & N. (1973). 'Encyclopedia of Australia.' (Frederick Warner & Co: London.) Edn 2.
- Pryor, L.D. (1954.) Plant communities. In White, H.L. (ed.), 'Canberra — A Nation's Capital.' (Angus & Robertson: Sydney.) pp. 153-161.
- Strusz, D.L. (1971). 1: 250,000 Geological Series — Explanatory Notes. CANBERRA, Australian Capital Territory & New South Wales. (Bureau Mineral Resources: Canberra.)

*For a full reference list see Ramsay, H.P. (1984). Census of New South Wales mosses, *Telopea* (2)5: 455-533.